Draft Studies Completed on Cleanup of PCBs in Lower Fox River Sediments

March 1999

Draft Remedial Investigation, Risk Assessment and Feasibility Study Available for Public Review

The Wisconsin Department of Natural Resources (DNR) has been studying the Lower Fox River for many years to gather information to clean up polychlorinated biphenyls (PCBs) in river sediments. Since March 1998, DNR has been working closely with the U.S. Environmental Protection Agency (EPA) and other agencies to develop cleanup plans following the steps in federal Superfund law. The EPA is funding the studies.

At this time the DNR is not recommending any one plan for cleanup of the Lower Fox River. We are releasing for public comment, a series of scientific draft reports. However, before these reports are completed, the DNR is releasing the drafts of them so that the pubic and other interested parties have the opportunity to provide input into them. Since the content and judgements in these reports will be the basis for all future decisions we thought it important to provide this opportunity. Once DNR has received your comments on the drafts, we will proceed with further development of these documents and the selection of a proposed cleanup plan. Information received from the public will be used to help finalize a cleanup solution. The public will again be given an opportunity to comment on the proposed plan in the future.

The remedial investigation (RI) determines the types, levels and locations of the contaminants. The risk assessment (RA) explores health effects on people and wildlife. Finally, the feasibility study (FS) evaluates possible cleanup methods.

Information from both pilot dredging projects (Deposit N and Sediment Management Unit 56/57) has been added to these draft studies. As more information is available from the projects, it will be added to the final studies.

The DNR, the EPA or responsible parties may carry out a cleanup of PCBs in the Lower Fox River. Regardless of who cleans up the river, the three studies will be used to determine a cleanup alternative for the Lower Fox River.

Public input and acceptance is a key factor before making a final decision on the best cleanup plan for the Lower Fox River. The draft feasibility study includes many choices with benefits, potential risks and drawbacks. The Department of Natural Resources invites interested Fox Valley residents to review the studies and provide comments on all elements of the studies and cleanup alternatives. The DNR will review all public comments before proposing a cleanup plan for the whole river.

This fact sheet provides:

1. a summary of the three studies,
2. the schedule and next steps in the evaluation process,
3. ways the public may comment on this preliminary cleanup plan. These three draft reports will be finalized later this year once public comments are considered.

Public comment period

DNR will accept written comments on these draft studies during a 45-day comment period from Feb. 26-April 12, 1999. The full reports are available for review in area libraries listed on page 16 and posted on the DNR's Web page at < http://www.dnr.state.wi.us/org/water/wm/lowerfox/ > .

Send written comments on the draft evaluations to Lower Fox River Cleanup, RR/3, Wisconsin Department of Natural Resources, 101 S. Webster. P.O. Box 7921, Madison, WI 53707. Comments must be postmarked by April 12, 1999.

Copies of comments should also be sent to: Fox River RI/FS, U.S. EPA - SR/6J, 77 W. Jackson Blvd., Chicago, IL 60604.

WISCONSIN DEPT. OF NATURAL RESOURCES

Department of Natural Resources
PUB-CE - 255

Remedial Investigation

The main purpose of the remedial investigation is to locate and measure PCBs found in sediments of the Lower Fox River. This investigation forms the foundation to evaluate risks to people and the environment in the risk assessment and also cleanup options in the feasibility study.

In large part, the investigation summarizes numerous studies conducted during the 1980s and '90s. It added results from work conducted during 1998 to fill in gaps of existing information. The present database includes 24 separate studies and more than 360,000 analyses of contaminants in sediment, water, fish and wildlife.

As many as 360 different chemicals have been found in the water, sediments, fish and wildlife of the Lower Fox River. These chemicals include PCBs, dioxins, furans, mercury, ammonia, DDT and other pesticides (see table on page 6 for more information on these chemicals). The Lower Fox River, which flows northeast for about 39 miles from Lake Winnebago at Neenah-Menasha to the river's mouth at Green Bay, contributes more PCBs to Green Bay and Lake Michigan than any other source.

What and where are PCBs?

PCBs are stable, man-made compounds. They absorb heat and do not easily break down. Because of these properties, they have been widely used in electrical equipment, hydraulic fluids, fire retardants, and many other commercial and industrial processes. In the Fox Valley, PCBs were used in the manufacturing and recycling of carbonless copy paper. As a result, PCBs were released to the river in wastewater discharges.

The manufacture and use of PCBs ended in the early 1970s. However, estimates show that more than 98 percent of the PCBs were discharged to the river before this time. Many of these PCBs settled into the river's bottom. Active discharges from industry and wastewater treatment plants to the Lower Fox River were virtually eliminated in the early 1980s.

The draft investigation confirmed the presence of 35 individual contaminated sediment deposits in the Lower Fox River between Lake Winnebago and De Pere. Sediments in these deposits have an estimated total volume around 2 million cubic yards and contain about 8,600 pounds of PCBs. From the De Pere dam downstream to the mouth of the river at Green Bay, there is a continuous layer of contaminated sediment. This large deposit has an estimated volume of 8 million cubic yards and contains around 55,000 pounds of PCBs. (See figures on pages 3-6.)

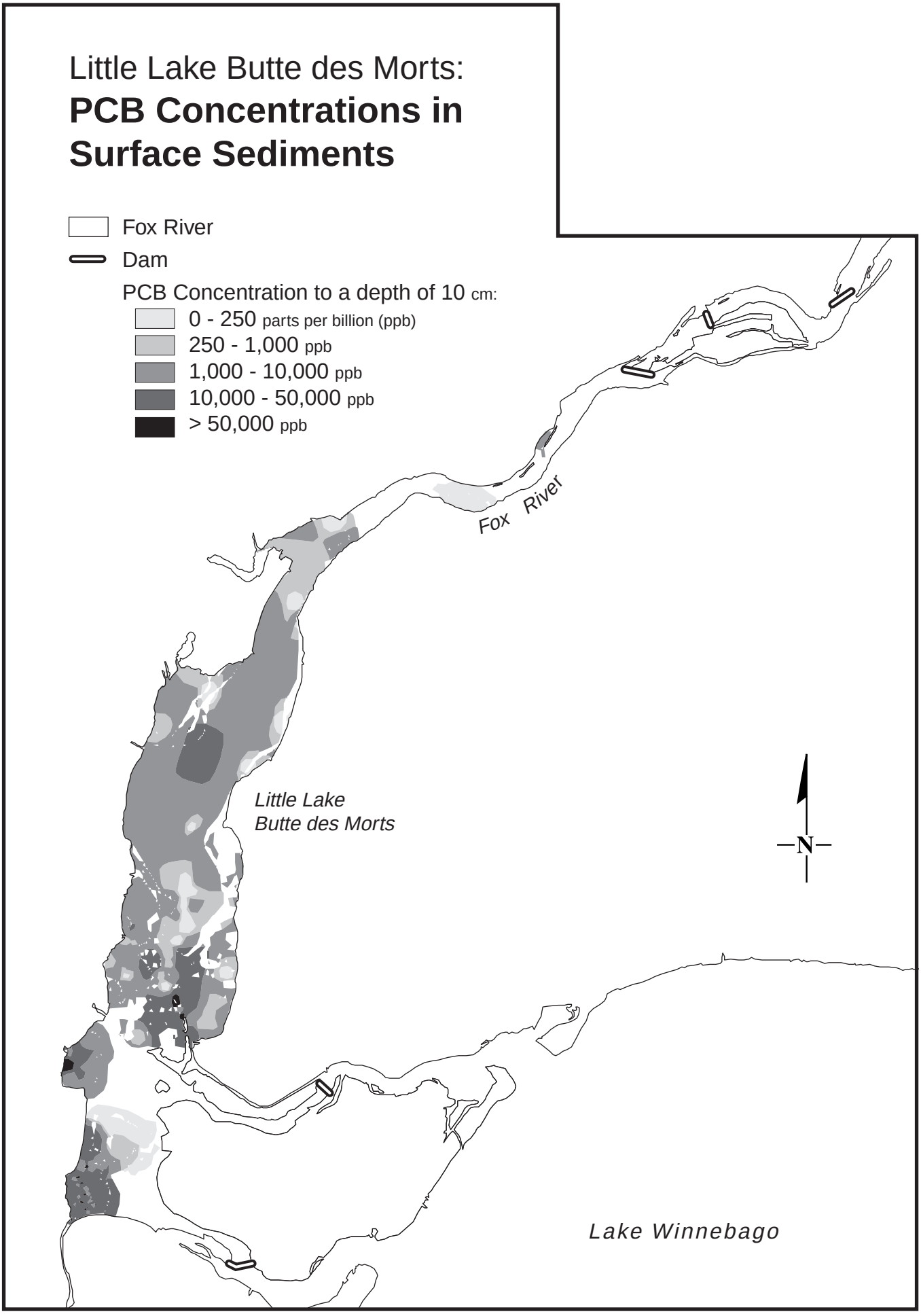
An estimated 63,000 pounds of the PCBs previously discharged remain in the Lower Fox River. Most of them are downstream of the De Pere dam. An even larger quantity has passed through the Lower Fox River to Green Bay, Lake Michigan and beyond. Results of the intensive "Mass Balance" study conducted by the DNR and EPA in 1989 showed that about 160,000 pounds of PCBs have already found their way into Green Bay from the Lower Fox. It also showed that about 620 pounds of PCBs enter the bay from the river each year.

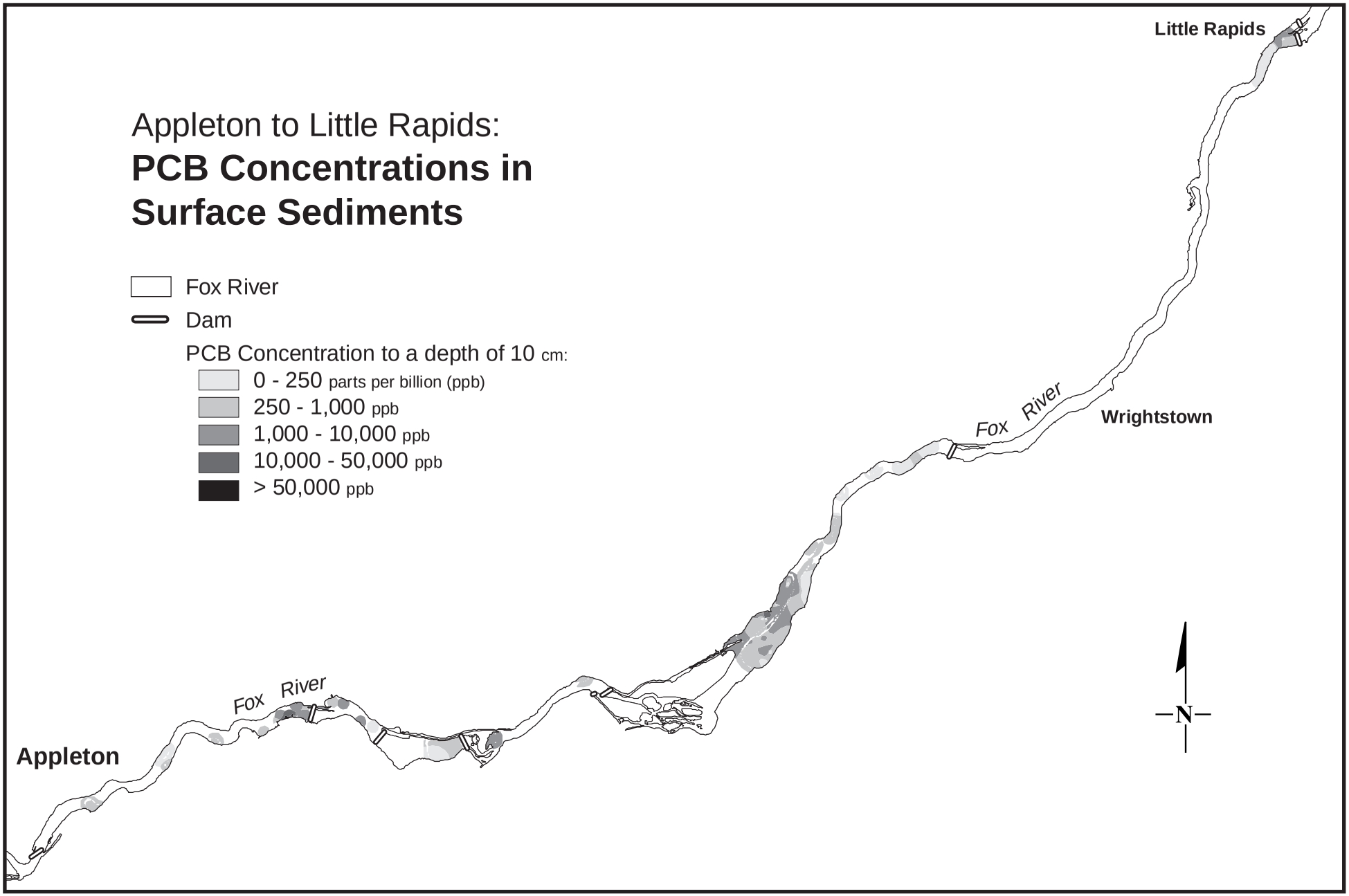
PCBs from the sediments continue to get into the food chain of the river because of the activities of small plants and animals and erosion of sediments by the river's current.

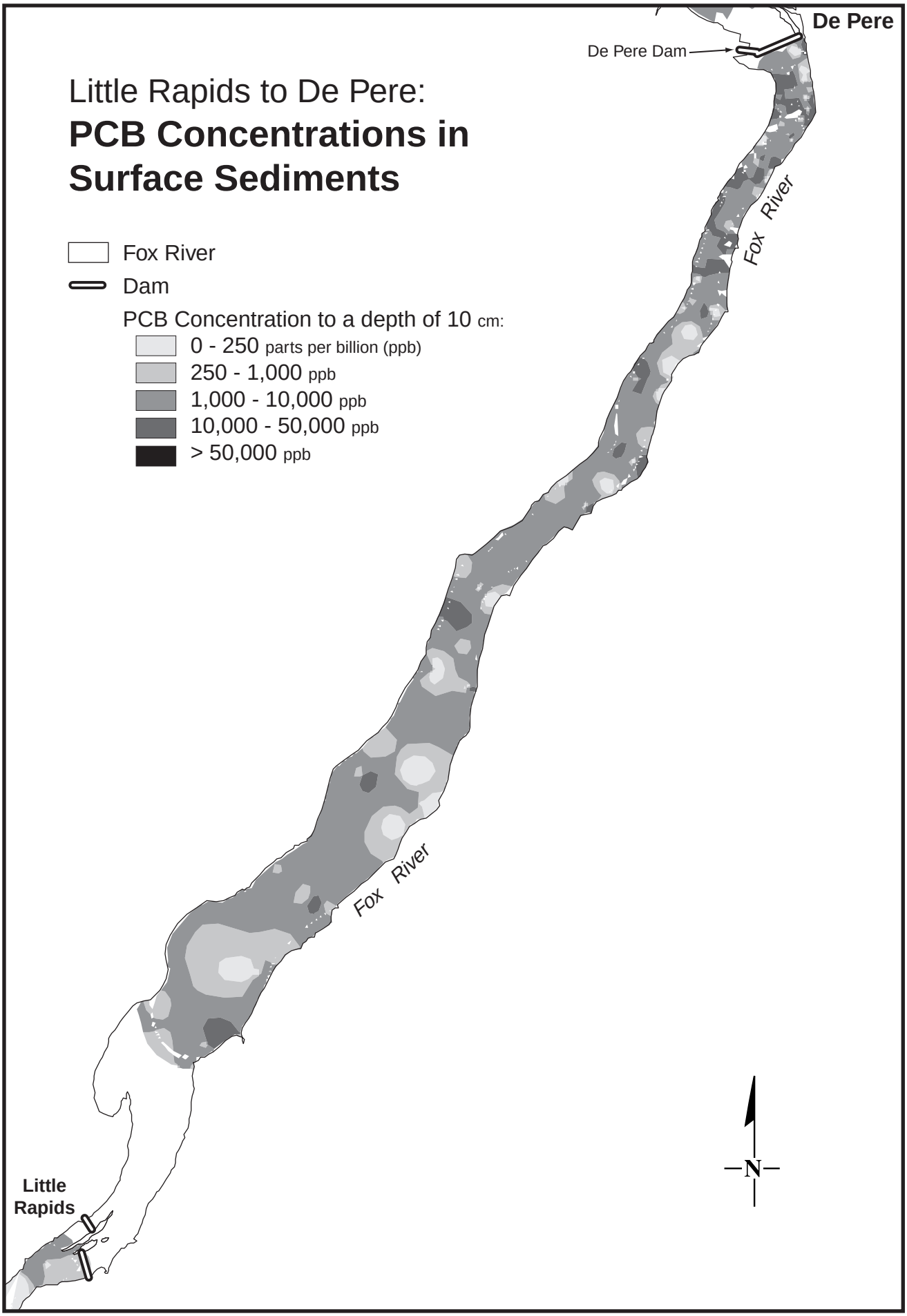
For this reason, cleaning up PCBs is a high priority of the Fox River Intergovernmental Partners. This group includes DNR, EPA, the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the Menominee Indian Tribe of Wisconsin, and the Oneida Tribe of Indians of Wisconsin, with assistance from the Wisconsin Department of Health and Family Services.

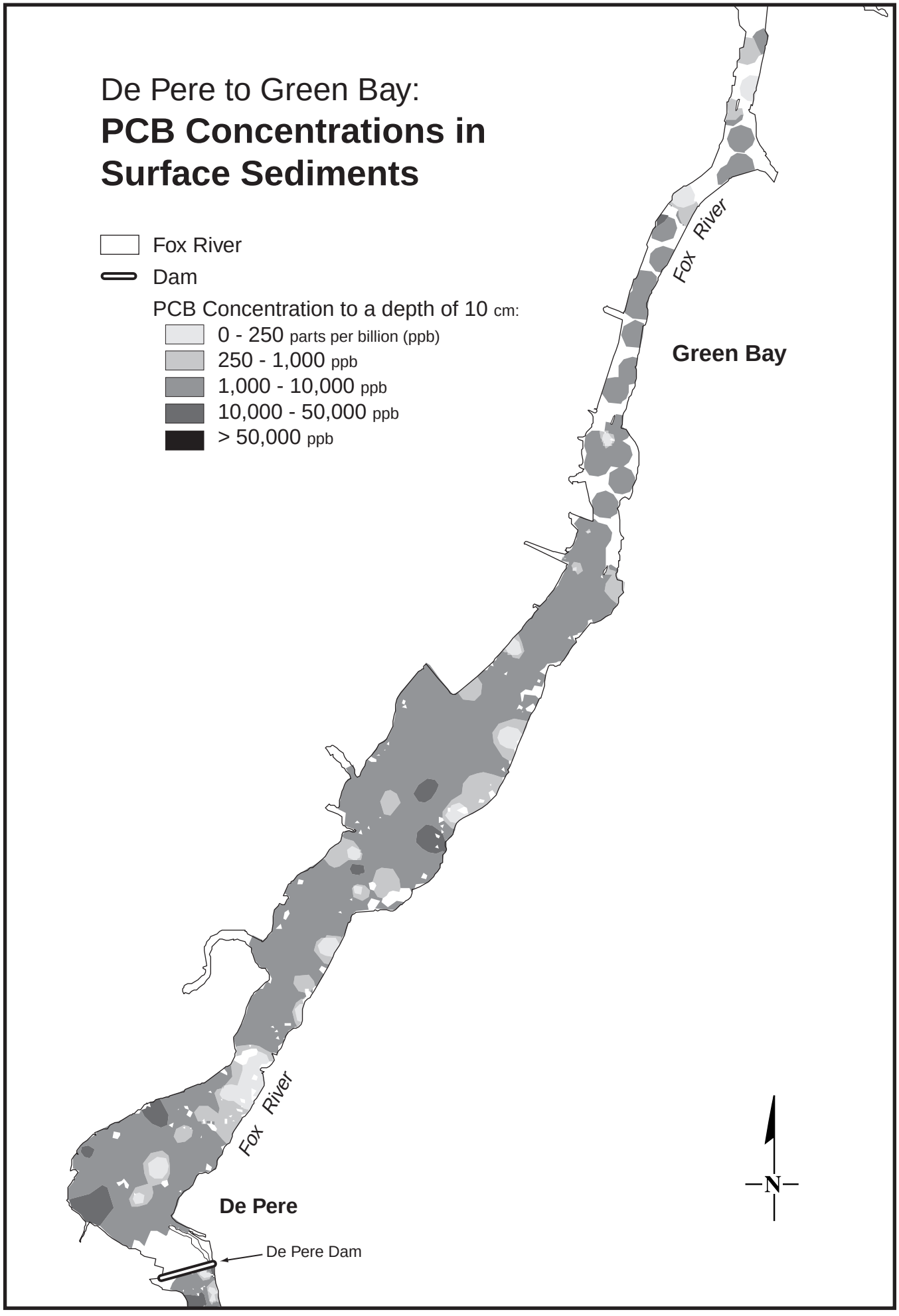
Little Lake Butte des Morts:

PCB Concentrations in Surface Sediments




Little Rapids
Appleton to Little Rapids:
PCB Concentrations in Surface Sediments
Fox River
Dam
PCB Concentration to a depth of 10 cm:
0 - 250 parts per billion (ppb)
250 - 1,000 ppb
1,000 - 10,000 ppb
10,000 - 50,000 ppb
> 50,000 ppb
Fox River
Wrightstown
Fox River
Appleton
N


Little Rapids to De Pere:
PCB Concentrations in Surface Sediments
Fox River
Dam
PCB Concentration to a depth of 10 cm:
0 - 250 parts per billion (ppb)
250 - 1,000 ppb
1,000 - 10,000 ppb
10,000 - 50,000 ppb
> 50,000 ppb
De Pere
De Pere Dam
Fox River
Fox River
Little Rapids
N


De Pere to Green Bay:
PCB Concentrations in Surface Sediments
Fox River
Dam
PCB Concentration to a depth of 10 cm:
0 - 250 parts per billion (ppb)
250 - 1,000 ppb
1,000 - 10,000 ppb
10,000 - 50,000 ppb
> 50,000 ppb
Fox River
Green Bay
Fox River
De Pere
De Pere Dam
N

Risk Assessment

The risk assessment estimates which chemicals in the Lower Fox River could harm people, fish, wildlife and the environment. The risk assessment:

- Identifies chemicals found in the river that could cause health problems for people or animals;
- Considers how people, fish and wildlife might be exposed to those chemicals;
- Assesses the health effects of the chemicals; and
- Proposes levels of the chemicals that would protect people's health and the environment.

Results from the risk assessment will not only help state and federal agencies decide whether to clean up the Lower Fox River, but will help in determining how much cleanup is needed. The agencies will also use the risk assessment as a guide when selecting cleanup alternatives — ones that effectively reduce or eliminate risk to people, wildlife and the environment.

Risk findings

When compared to any other chemical found in the Lower Fox River, PCBs in sediments pose the greatest risks to both human and ecological health.

- Almost all of the risk to human health is from exposure to PCBs.
- Eating fish caught in the river and bay is the main way that PCBs can affect people's health. People who regularly eat fish and waterfowl from the river are particularly at risk.
- A small portion of the risk to people's health is from exposure to pesticides and dioxins that are found with the PCBs in sediments and fish tissue.
- Waterfowl hunters and consumers may also have elevated risk, although their risk is about 10 times lower than risks to people who regularly eat fish.
- Cancer risks from exposure to PCBs by eating fish or birds are 100 to 1000 times higher than standards set to protect people's health.
- Noncancer risks (like neurological impacts to infants and children) for people who eat contaminated fish is 56 times higher than state and federal health standards.
- PCBs in fish pose the greatest risks to fish-eating birds and mammals.
- From De Pere to Green Bay, PCB risks to animals were 100 to 1,000 times greater than risks from any other contaminant in that section of the river.

Risk assessors found that reducing the levels of PCBs in river sediments would be the most effective way to reduce health risks to people and animals who depend on the Lower Fox River and Green Bay. The risk assessment includes a focused look at risks related to PCBs. Most importantly, the risk assessment — combined with the models used in the feasibility study — helped scientists understand the amount of risk reduction each cleanup alternative will provide.

How the human risk assessment is done

The first step in a risk assessment is to find out the levels of contaminants and where people are expected to come in contact with them. For the Lower Fox River, risk assessors looked at fish and waterfowl tissue, river water, sediments and air. Sampling information provided a good understanding of the contaminant levels in most of these areas. Very complete information is available about contaminant levels in fish from years of sampling for DNR studies.

The second step is to find out how people are exposed to the contaminants. It is estimated that 47,000 sport anglers and from 2,000 to 5,000 Hmong and Native American anglers and their families are potentially exposed to PCBs. No two people have the same daily routines, habits or diets. For this reason, everyone can have different levels of exposure. Scientists estimate the level of exposure for people likely to have the greatest exposure. Scientists often have to assume quite a bit about these exposures because they do not know the habits of everyone who could be exposed. However, for fish consumption, good information is available about how much fish from the Fox River people eat. Studies have improved understanding of the potential health effects associated with fish consumption. Both cancer and noncancer health effects are considered.

The final step is to consider what is known about the contaminants to determine if they are likely to cause health problems. Information from human studies is considered to be the strongest evidence, but scientists also consider studies done on laboratory animals. Because it is difficult to find large groups of people who have been similarly exposed to a chemical, scientists usually rely on animal studies.

Assessors found that the remaining exposure scenarios for people — from wading, swimming, breathing air and drinking water — are not likely to cause illness.

Health risks from eating PCB-contaminated fish

PCBs build up in people's bodies over time and are stored in fat. It may take months or years of regularly eating contaminated fish to build up enough PCBs to affect people's health. Human and animal studies on exposure to PCBs found: 1) developmental problems and reduced mental abilities in infants and children born to women who were exposed to PCBs; 2) problems with the nervous, immune, circulatory and hormonal systems; 3) liver, brain and skin problems; and 4) increased risk of cancer. Health studies have linked PCBs to reproductive problems in wildlife and fish species living in the Lower Fox River and Green Bay area.

Since 1976, Wisconsin has issued fish consumption advisories for most species of fish caught in the Lower Fox River because of PCB contamination in fish. The advisories warn residents to limit the amount of fish they eat. They provide tips on how to properly clean and cook fish to reduce the amount of PCBs. Despite these fish advisories, many anglers are unaware of the risks and many choose to ignore them.

Ecological health risks

Similar to the human health assessment, the first step in the ecological risk assessment is to find out which species of fish and wildlife are exposed to contaminants and how they are exposed. Researchers evaluated various insects, fish, birds and mammals. They found that animals are exposed to PCBs in three ways: 1) they absorb dissolved chemicals in surface water; 2) they ingest contaminated sediments; and 3) they eat contaminated prey – mainly fish and insects.

Next, researchers compared levels of chemicals in water, sediment and animal tissues with levels set to protect animals' health. Certain animals are more susceptible to effects from PCBs because of their place in the food chain, their sensitivity to contaminants, or because they live in direct contact with contaminated sediments.

Researchers found the chemicals of concern could harm wildlife in the Lower Fox River and Green Bay in a number of ways. Health effects from these chemicals threaten reproduction, growth and survival. As with people, PCBs pose the greatest risks to animals in the Lower Fox River and Green Bay. Sediment-dwelling organisms and fish are at greatest risk. Between Appleton and Little Rapids, PCBs were found in eagle eggs and adult eagle tissues at levels known to cause deformities in birds.

PCB cleanup levels

The risk assessment proposes safe levels of PCBs in sediments that would protect human and ecological health. These concentrations are called "sediment quality thresholds." To evaluate cleanup technologies and alternatives in the feasibility study, the risk assessment proposes to clean up PCBs in river sediments until concentrations measure or average 250 parts per billion (ppb). This level would protect both human and ecological health.

To determine safe levels of PCBs that would protect people's health, the risk assessment used limits set in the Great Lakes Sport Fish Consumption Advisory (GLSFCA). For unlimited fish consumption, the GLSFCA advisory assumes that PCB concentrations in fish will be no higher than 50 ppb.

The cleanup level of 250 ppb would allow people to eat an unlimited amount of sport fish from the Fox River. Cleanup to this level is protective to fish, birds and mammals.

Chemicals of concern identified in the Lower Fox River

PCBs were used in several industrial processes from 1957 to 1972. PCBs were banned in 1976. They are linked to reproductive problems, poor mental development in children, liver damage, skin irritation, hormone problems and cancer.

Dioxins and Furans are byproducts of the wood treatment and bleaching processes often associated with pulp and paper industries. Dioxins can cause cancer in people. Both dioxins and furans can damage the liver, the pancreas, and the circulatory and respiratory systems.

DDT/DDE/DDD are pesticides that were commonly used in the Fox Valley before being banned in the early 1970s. They are known to cause cancer in people.

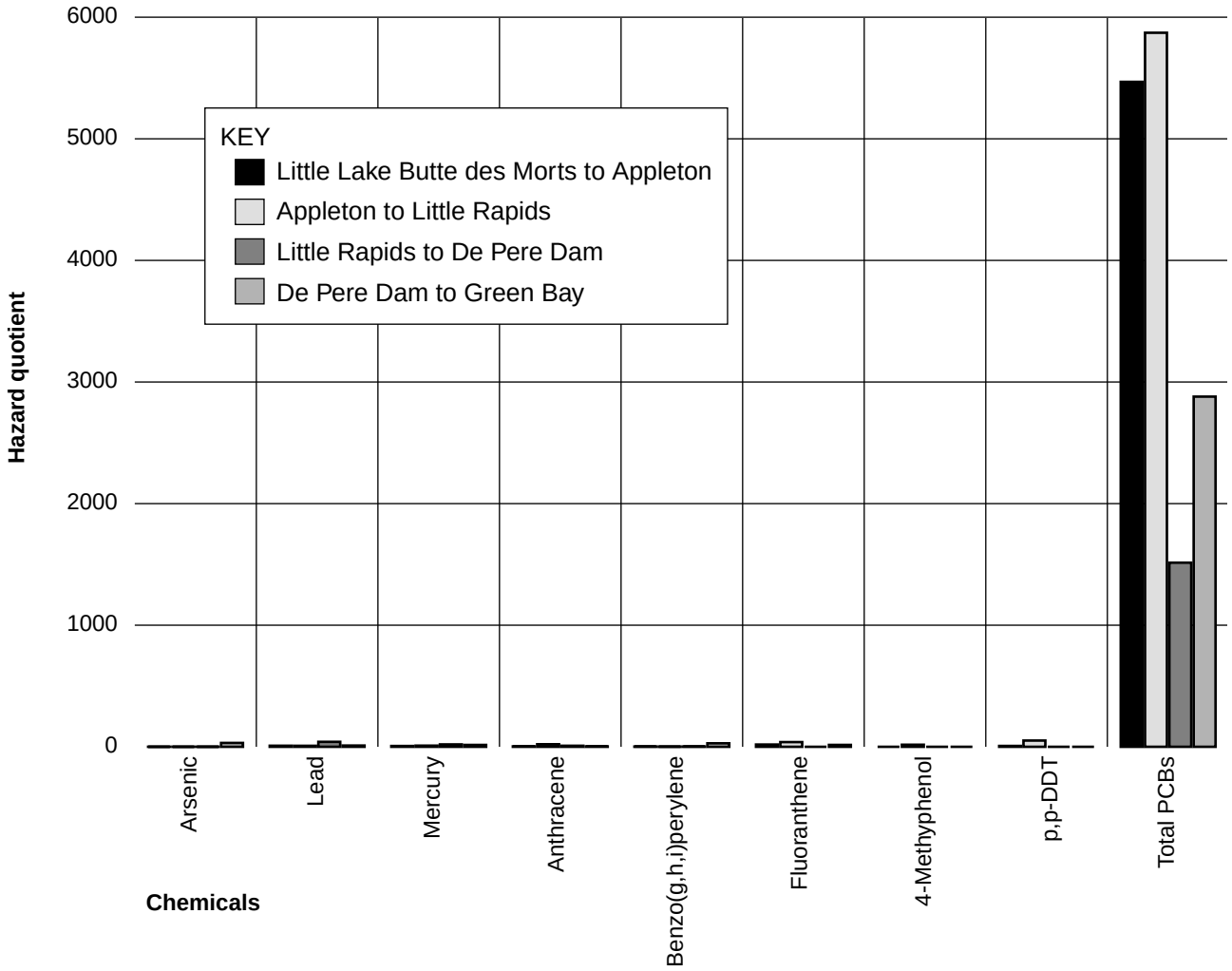
Dieldrin is a pesticide that can cause cancer in people.

Mercury in the Lower Fox River was used in the papermaking process until 1971 when its use was discontinued. It can cause severe damage to the nervous system.

Lead in the river is not associated with a specific source or use. It is known to cause developmental problems in children.

Arsenic in the river is not associated with a specific source or use. It is known to cause skin cancer in people.

Comparing risks from chemicals of concern



Calculated risk from PCB-contaminated river sediments is approximately 100 times higher than from any other chemical pollutant found in the Lower Fox River. Hazard quotient is the ratio of measured PCBs to the concentration at which PCBs are toxic in the environment.

Feasibility Study

The feasibility study identified and evaluated various options for cleaning up PCBs in the Lower Fox River. It set cleanup objectives and then screened technologies that met those objectives. The study breaks the river into four reaches and includes many alternatives to clean up PCBs in sediments within each reach.

To help develop cleanup alternatives, DNR and EPA used computer models developed by national experts. These models helped determine how PCBs move through the river and bay over time.

Based on findings from the remedial investigation and risk assessment, the feasibility study proposes solutions that reduce risks to people and wildlife who eat fish. Before proposing cleanup options for each of the four river reaches, scientists: 1) considered physical characteristics of each reach, 2) estimated human-health and ecological risks, and 3) considered other information specific to each river reach.

The following factors are considered in developing and evaluating cleanup options. (These are known as Superfund's nine cleanup criteria.)

1. Overall protection of human health and the environment
2. Compliance with state and federal laws. Do alternatives meet local, state or federal standards?
3. Reduction of toxicity, mobility and volume of contamination. Does the technology effectively reduce contamination?
4. Implementability. How easy is it to construct a technology?
5. Long-term effectiveness. Is an alternative permanent and effective at reducing contamination and risk over time?
6. Short-term effectiveness. Does the alternative protect the community and workers during cleanup?
7. Cost. How much does the option cost? This includes incremental cost — how much it costs to remove contaminants to certain levels in order to protect human and ecological health. Most options have a threshold where trying to clean up every last trace of PCBs becomes less cost-effective and potentially prohibits cleanup elsewhere.
8. Community acceptance. Which alternative does the community prefer?
9. State acceptance. Does the state agree with the cleanup plan?

Cleaning up the river by reaches

Next the study developed a series of cleanup plans for each of the four reaches. They generally include a combination of capping, dredging, treatment and disposal.

The four Lower Fox River reaches are:

- Little Lake Butte des Morts to Appleton
- Appleton to Little Rapids (just downstream of Wrightstown)
- Little Rapids to De Pere Dam
- De Pere Dam to Green Bay

The alternatives for each river reach are identified in the following tables. These tables identify preliminary information and costs for each alternative within the reach. Costs are preliminary and are used for comparative purposes only. Once a final cleanup plan is chosen, more information on the cost to clean up the Lower Fox River will be available.

Comparing cleanup alternatives

The study evaluates each alternative against a series of questions before forwarding an alternative for further consideration in the feasibility study:

- What are the remaining risks after cleanup?
- What is the level of disruption to local communities during construction?
- What is the level of administrative effort necessary to implement each alternative?
- What is the volume of contaminated sediments cleaned up from the Lower Fox River?
- What is the cost of implementing each alternative?

Appleton to Little Rapids river reach

	Alternative A		Alternative B	Alternative C
	Low* Level	High* Level	Institutional Controls	No Action
Sediment Removal Volume (cubic yards)	338,000	0	0	0
Mass of PCBs (pounds)	660	0	0	0
Removal				
Hydraulic	✔			
Dewatering				
Settling ponds	✔			
Disposal				
Off-site (licensed landfill)	✔			
Institutional Controls			4	
Estimated Cost **	$23,660,000		$1,200,000	$0
Estimated Time to Implement	5 years		—	—

*Low Level = < 50 parts per million (ppm) High Level = > 50 ppm
**Costs are preliminary and are used for comparison purposes only.

Little Lake Butte des Morts river reach

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E		Alter. F	Alter. G
	Low* Level	High* Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Institutional Controls	No Action
Sediment Removal Volume (cubic yards)	1,563,000	63,000	1,066,000	63,000	805,000	63,000	805,000	63,000	679,000	63,000	0	0
Mass of PCBs (pounds)	3,421	557	3,399	557	1,575	557	1,575	557	977	557	0	0
Removal												
Hydraulic	✔	✔	✔	✔	✔		✔	✔	✔	✔		
Mechanical						✔				✔ (8,000 cu. yds.)		
Dewatering												
Mechanical								✔				
Settling ponds on Arrowhead Park	✔	✔	✔	✔					✔	✔		
Settling on barge						✔				✔		
Settling ponds in on-site Confined Disposal Facilities					✔		✔					
Treatment												
High-temperature Thermal Destruction						✔						
Disposal												
Off-site (licensed landfill)	✔	✔	✔	✔				✔	✔	✔		
On-site Confined Disposal Facility					✔	✔	✔					
Capping												
Armored									✔ (6,000,000 sq. ft)			
Institutional Controls			✔		✔		✔		✔		✔	
Estimated Cost**	$93,500,000		$67,000,000		$58,200,000		$51,500,000		$56,600,000		$1,200,000	$0
Estimated Time to Implement	5 years		4 years		3 years		3 years		1 year		—	—

*Low Level = < 50 (ppm) High Level = > 50 ppm **Costs are preliminary and are used for comparison purposes only.

Little Rapids to De Pere Dam river reach

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E		Alternative F		Alt. G	Alt. H
	Low* Level	High* Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Institut. Controls	No Action
Sediment Removal Volume (cubic yards)	1,188,000	0	1,188,000	0	1,065,000	0	1,065,000	0	593,000	0	0	0	0	0
Mass of PCBs (pounds)	3,144	0	3,144	0	2,361	0	2,361	0	1,540	0	0	0	0	0
Removal														
Hydraulic	✔		✔		✔		✔		✔					
Mechanical														
Dewatering														
Settling ponds	✔				✔									
Settling ponds in new landfill			✔											
Treatment														
High-temperature Thermal Destruction														
Disposal														
Off-site (licensed landfill)	✔				✔									
Off-site (newly constructed landfill)			✔											
On-site Confined Disposal Facility							✔		✔					
Capping														
Sand									✔ (8,000,000 sq. ft)		✔ (12,000,000 sq. ft)			
Institutional Controls					✔		✔		✔		✔		✔	
Estimated Cost **	$113,800,000		$22,200,000		$103,200,000		$29,300,000		$42,100,000		$22,000,000		$1,200,000	$0
Estimated Time to Implement	4 years		4 years		4 years		4 years		4 years		ongoing monitoring		—	—

*Low Level = < 50 ppm High Level = > 50 ppm **Costs are preliminary and are used for comparison purposes only.

De Pere Dam to Green Bay river reach

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E		Alternative F		Alt. G	Alt. H
	Low* Level	High* Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Institut. Controls	No Action
Sediment Removal Volume (cubic yards)	5,440,000	250,000	5,440,000	250,000	4,815,000	250,000	4,471,000	250,000	4,471,000	250,000	4,011,000	250,000	0	0
Mass of PCBs (pounds)	48,358	3,159	48,358	3,159	43,353	3,159	40,297	3,159	40,297	3,159	38,804	3,159	0	0
Removal														
Hydraulic			✔	✔										
Mechanical	✔	✔			✔	✔	✔	✔	✔	✔	✔	✔		
Dewatering														
Settling on barge	✔	✔			✔	✔	✔	✔	✔	✔	✔	✔		
Settling ponds in landfill			✔	✔										
Settling ponds in on-site Confined Disposal Facilities							✔		✔		✔			
Treatment														
High-temperature Thermal Destruction								✔						
Disposal														
Off-site (licensed landfill)	✔	✔			✔	✔				✔		✔		
Off-site (newly constructed landfill)			✔	✔										
On-site Confined Disposal Facility							✔	✔	✔		✔			
Capping														
Sand											✔ (6,000,000 sq. ft)			
Institutional Controls					✔		✔		✔		✔		✔	
Estimated Cost**	$490,000,000		$45,900,000		$437,600,000		$131,000,000		$122,700,000		$130,500,000		$1,200,000	$0
Estimated Time to Implement	10 years		8 years		7 years		7 years		7 years		ongoing monitoring		—	—

*Low Level = < 50 ppm High Level = > 50 ppm **Costs are preliminary and are used for comparison purposes only.

Sediment cleanup option glossary

A number of technologies can be used to clean up sediment contaminated with PCBs. The following list includes technologies that work both in and out of the river. Over 200 technologies were considered before settling on the following list of choices:

No action

No action is the status quo with continuing fish and waterfowl consumption advisories. It is used as a starting point of comparison per federal guidance.

Institutional controls

Examples include continued fish and waterfowl consumption advisories or possible restrictions on navigational dredging and other water use activities.

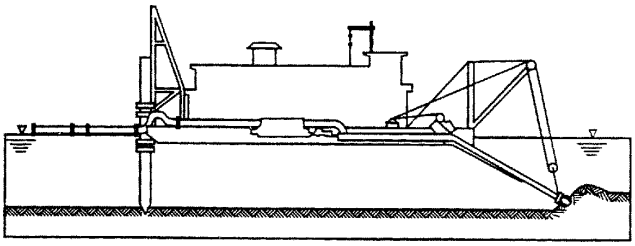
Dewatering

This involves separating water from sediment before disposal or treatment. Mechanical dewatering uses a press to squeeze the water out of the sediments. Passive dewatering such as settling ponds or in-barge dewatering are also used to remove water from sediments. In passive dewatering, sediments gradually accumulate on the bottom so water on top can be removed and treated.

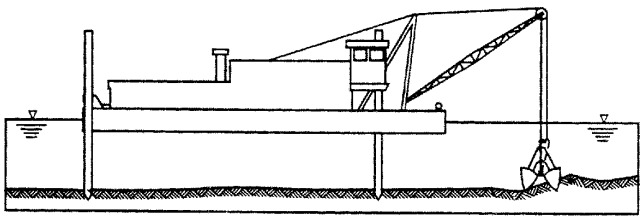
Mechanical presses can be used to separate water from contaminated sediments before disposal.

Removal

Hydraulic dredging involves excavating sediments from the river using a vacuum-like device. Mechanical dredging uses scooping devices like a backhoe, clamshell or closed-bucket clamshell to remove sediments. Removal is usually followed by dewatering, treatment if PCB concentrations are high, and disposal.



Hydraulic dredges suck contaminated sediments off the river bottom.



Mechanical dredges scoop materials off the river bottom.

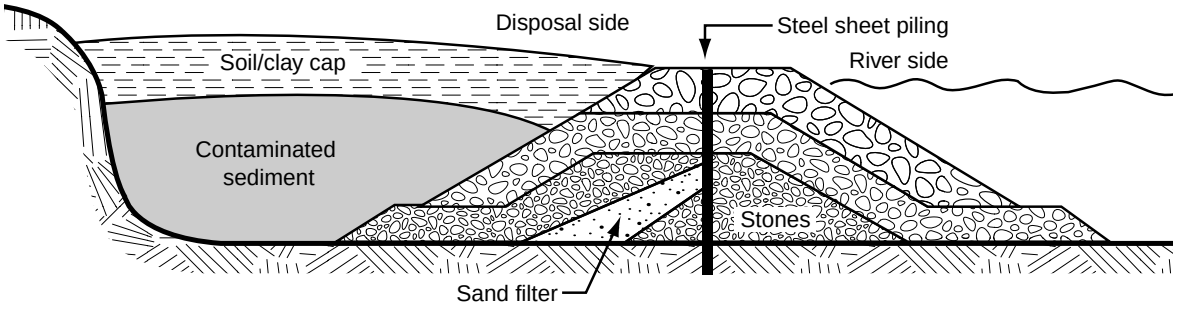
Treatment

Off-site ("ex situ") treatment may immobilize or breaks down PCBs. High-temperature thermal destruction is an example of a technology that can destroy PCBs using heat. In-river ("in situ") treatment immobilizes or breaks down PCBs when different agents are injected into contaminated sediments while still on the river bottom. The feasibility study considers treatment for PCB concentrations greater than 50 parts per million. There are many other forms of treatment.

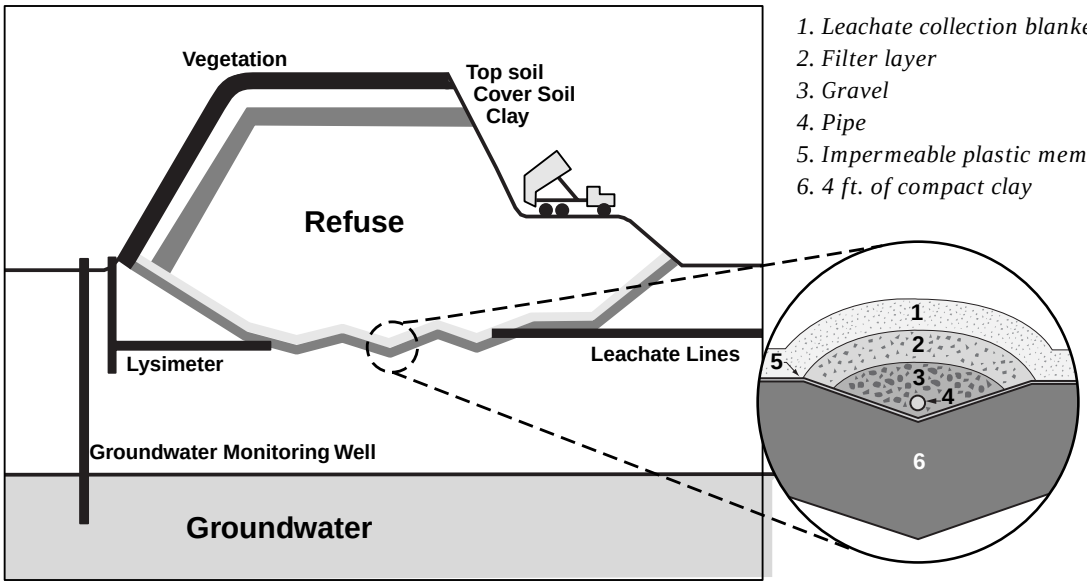
Disposal

Contaminated sediments can be disposed of in a licensed solid-waste landfill that meets state and federal requirements or in a confined disposal facility (CDF). A confined disposal facility is an engineered structure in or close to the river. In-river CDFs are surrounded by walls made of sheet piling, rock and rubble that isolate contaminated sediments. These confined facilities are common in the Great Lakes.

A confined disposal facility with a filter layer and steel barrier that will isolate contaminated sediment and provide for disposal adjacent to the river.



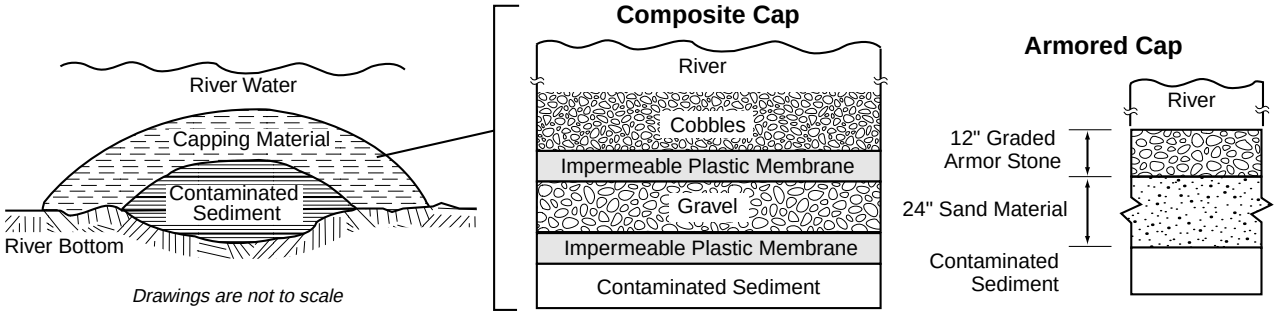
Modern landfills are built with multiple protective layers to prevent leaking.



1. Leachate collection blanket
2. Filter layer
3. Gravel
4. Pipe
5. Impermeable plastic membrane
6. 4 ft. of compact clay

Capping

This involves placing sand, gravel, an impermeable plastic membrane, and/or stones over the contaminated sediment. These materials, or a combination of them, isolate contaminated sediment from river water.



Drawings are not to scale

Next steps

Public comments needed

These draft documents are now available for public review and comment. Citizens have the opportunity to read the studies at information repositories set up at local libraries and on the DNR's Web site (see addresses below). Written comments will be accepted during the public comment period, which runs from Feb. 26 - April 12, 1999. People may also provide comments at public meetings scheduled for March 22 in Green Bay and March 23 in Appleton.

The DNR staff leading these studies will review all comments from the public as well as input from the EPA, other agencies and the companies potentially responsible for contamination. DNR will respond to comments in a document called a responsiveness summary. This summary will be available later this year, both at information repositories set up at Fox Valley libraries and on the Web.

The final reports, particularly the feasibility study, will provide the basis to develop the final recommended cleanup plan to include in the document known as the Record of Decision. The Record of Decision is the whole-river cleanup plan recommended by state and federal agencies. Once the department issues the proposed cleanup plan, people will have another opportunity to share their comments and concerns before the plan is finalized.

The proposed plan will include more detailed information on cleanup costs and time frames for implementing the cleanup.

Schedule of upcoming activities

- Final studies - Summer 1999
- Proposed cleanup plan - Summer/ Fall 1999
- Public comment period - Summer/ Fall 1999
- Record of Decision - Fall/winter 1999/2000
- Public comment period - Fall/ winter 1999/2000

Where to send comments:

- Send written comments on the draft evaluations to Lower Fox River Cleanup, RR/3, Wisconsin Department of Natural Resources, 101 S. Webster. P.O. Box 7921, Madison, WI 53707. Comments must be postmarked by April 12, 1999.
- Copies of comments should also be sent to Fox River RI/FS, U.S. EPA - SR/6J, 77 W. Jackson Blvd., Chicago, IL 60604.

For more information:

- Visit DNR's Web site at < http://www.dnr.state.wi.us/org/water/wm/lowerfox/ > . The text of the reports and some tables and figures will be posted on DNR's Web site during the week of March 1.
- Contact Irene Sadowski, DNR public affairs, at (608) 264-8952.
- Visit one of the information repositories set up at libraries in the Fox Valley. The full reports will be available at the following libraries:

Appleton Public Library
225 N. Oneida St.
Wrightstown Public Library
529 Main St.
Neenah Public Library
P.O. Box 569
DePere Public Library
380 Main Ave.
Oshkosh Public Library
106 Washington Ave.
Kaukauna Public Library
111 Main Ave.
Brown County Library
515 Pine St., Green Bay
Door County Library
104 S. Fourth Ave., Sturgeon Bay
Little Chute Public Library
625 Grand Ave.
Oneida Community Library
201 Elm St., Oneida

Wisconsin Department of Natural Resources
Bureau of Communication and Education
101 S. Webster St., Box 7921
Madison, WI 53707-7921